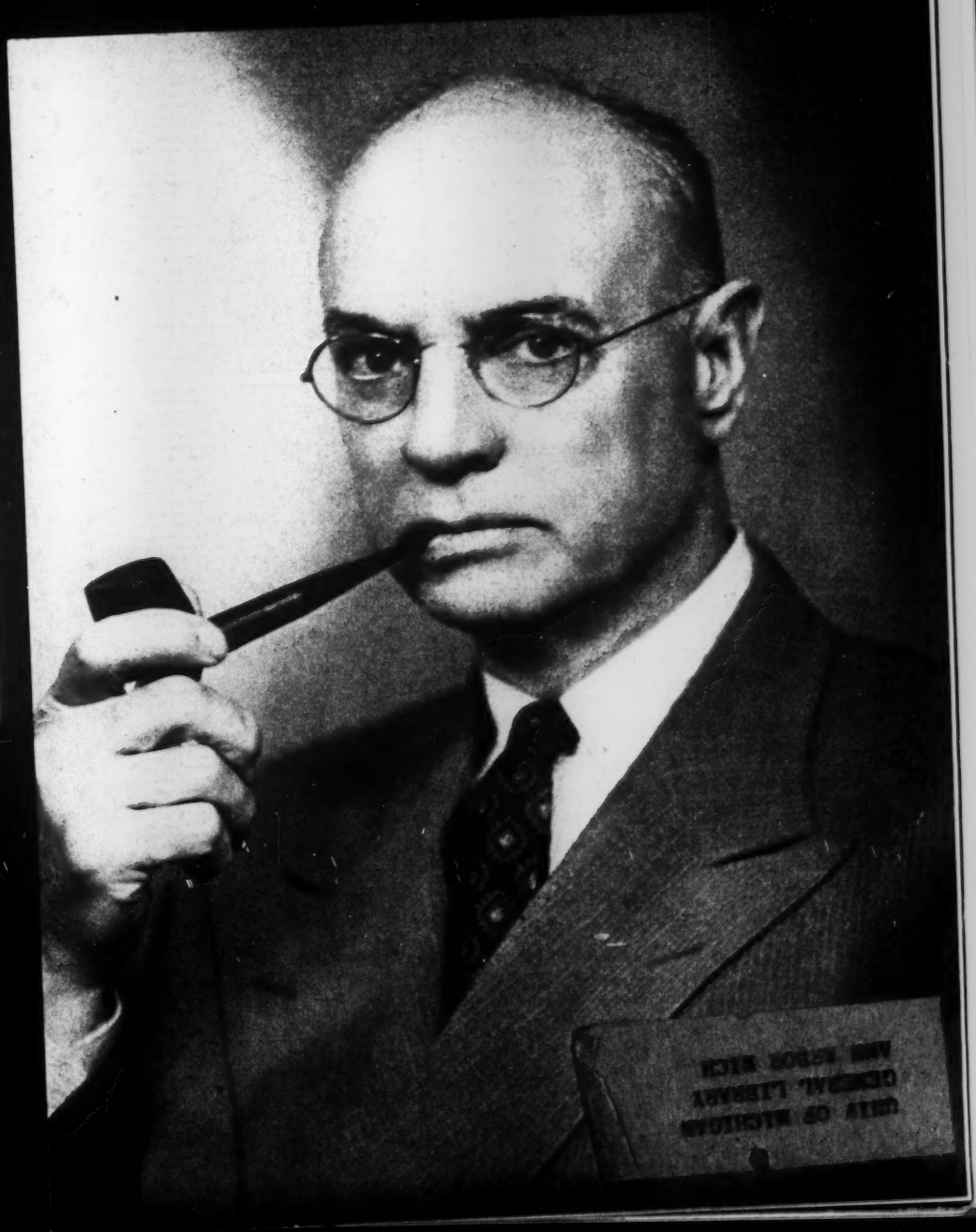
ENGINEERING NEWS-RECORD



T. VEATCH

AMERICAN WATER WORKS ASSOCIATION · 1881 ·

President

A W W A

UNIV OF MICHIGAN
CHEMICAL LIBRARY
ANN ARBOR MICH

Daylight STRETCHER

Engineered Floodlighting Permits 3-Shift Operation... Reduces Accidents

G-E Type L-68 floodlight for illuminating large outdoor installations

Among the first tools moved into a new construction area are floodlights, because contractors know that this is the only way to *stretch* precious daylight hours and reduce night accidents and vandalism. But contractors also know that there is more than one way to floodlight a job, just as there is more than one type of floodlight.

Buy Floodlighting . . . Not Lights

General Electric's Illuminating Laboratory runs continuous studies on outdoor lighting so that you may have the best possible floodlighting for each type of installation. The Type L-68 floodlight shown above, is just one of the new, improved lights which result from these studies. It is an efficient, sturdy floodlight, developed specially for the conditions encountered in large construction projects; its tough front glass keeps the reflector clean. It can be platform-mounted and easily skidded from place to place as the job progresses.

When you next have occasion to order floodlights, remember to buy *lighting*, not just *lights*. Let General Electric show you how to get the best engineered illumination through correct location of the correct floodlights. Contact your G-E representative or local G-E office. *Apparatus Department, General Electric Co., Schenectady 5, N. Y.*

Floodlighting was instrumental in the record-breaking construction of Fontana Dam (above), and also aided in the race against time at Anderson Ranch (below).

GENERAL ELECTRIC

655-60

ELECTRIFIED CONSTRUCTION

BETTER PRODUCT ★ LOWER COST

News of the Week

ENGINEERING NEWS-RECORD • JULY 17, 1947 • VOLUME 139 • NUMBER 3

Truman to seek completion of Inter-American highway

President orders plans for completion of road despite sharply critical report on work already done—Senate committee lists its findings in investigation

Despite an extremely critical report on activities on the Inter-American Highway issued by a special Senate committee a week ago (*ENR* July 10, vol.p. 20), President Truman has ordered the Public Roads Administration to formulate plans for completion of the road between the southern border of Mexico and the Panama Canal Zone.

Measures that will authorize this work—considered desirable in view of commitments made by President Roosevelt—are expected to be placed before Congress soon.

The President's plans were learned only a few days after a Senate Special Investigating Committe released an extensive report that severely scored the way federal agencies handled the attempted completion of the Inter-American road during the early years of the war. The committee suggested immediate study of the advisability of creating an Inter-American Highway Commission or authority by means of multilateral treaties with interested countries, the results of this study to be made available before added financial commitments are made by the United States.

Long sections impassable

Much has been done in building the highway, but extensive construction must still be done to complete the work. Of the 3,261 miles from Laredo, Texas, to the Canal Zone, 51 percent is now paved and 29 percent additional is all-weather road. Some 11 percent is only dry-weather road, and 9 percent of the distance—over 290 miles—is impassable throughout the year.

Of the impassable portions, 58 miles are located in Mexico, 23 miles in Guatemala, 33 miles in Nicaragua, 91 miles in Costa Rica and 28 miles in western Panama.

For a number of years a paved road has been available from Laredo, Texas, over the 763 miles to Mexico City and southward about 300 miles to the town of Oaxaca. Between the latter town and the Guatemalan border, the Mexican government has pushed work for several years and it is expected that by 1949 travel all the way across Mexico will be possible.

From western Guatemala it is also possible to drive across that country and the length of El Salvador, Honduras and Nicaragua, although some sections are not too good. The most difficult gap remaining to be completed is that in southern Costa Rica and western Panama, where extremely mountainous terrain must be crossed.

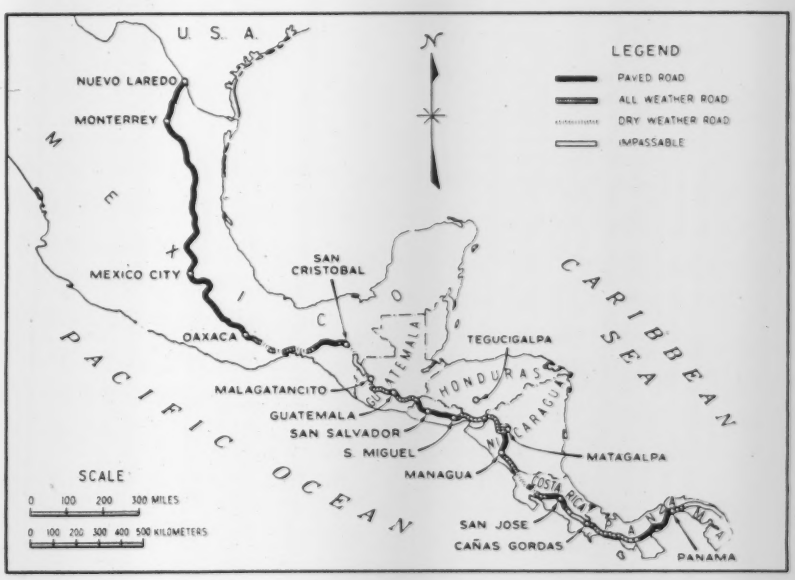
During the war the U. S. Army Engineers (with the aid of the PRA on short sections) attempted to complete the road from the Mexico-Guatemala border to the Panama Canal. A total of $68,000,000 has already been spent on the job, $8,000,000 additional has been alotted to the project, and American loans in the amount of $48,000,000 have been made to the Latin American republics for advancing the road.

Some work continues

Under supervision of the PRA, limited construction is now going ahead in Panama, Honduras, and Guatemala. Although no American aid is provided for construction in El Salvador, work in that country is continuing under the supervision of American engineers; while in Nicaragua, construction is advancing with local funds under the supervision of local engineers.

Because the U. S. under President Roosevelt made big promises to the Latin American republics, President Truman is now seeking to continue construction. Whether he will be able to get authorization at this time to continue the work appears questionable in view of the Senate committee's report. That committee not only found

(Continued on Page 3)



***Highway Status**—Spotlighted by Senate criticism, work on the 3,281-mi. Inter-American Highway continues in most Central American countries.*

NEWS IN BRIEF

In telegraphic form, here are latest news developments on the engineering and construction front during the week.

Labor—New working contracts recently signed to cover all 20 AFL building trades unions in the *Dayton, Ohio,* area call for general wage increases averaging 22½ cents per hour. . . .AFL civil engineers and surveyors in *Northern California* secured a 25 cent per hour wage increase as result of negotiations between individual contractors and the Technical Engineers' Union. The new rates affect chainmen, instrumentmen and chiefs of party.

Public Construction—Gov. J. H. Duff of *Pennsylvania* vetoed a $6,102,000 appropriation approved by the state legislature for improvements at the state's 14 teachers' colleges, on the ground that no coordinated plan exists for construction at the schools. . . .Construction has started on Northerly Island in Lake Michigan off downtown *Chicago* on a $1,600,000 2,800-ft. airplane landing strip to serve the city's business district. . . . Work has started on construction of a $3,000,000 men's dormitory at Louisiana State University, at *Baton Rouge.*

Bridges — The Charter Oak toll bridge between *East Hartford* and *Hartford, Conn.*, served 5,949,000 vehicles during the fiscal year ending June 30, with revenues totalling $557,865. . . . The AK-Sar-Ben Bridge, between *Omaha, Neb.* and *Council Bluffs, Iowa,* is now free of debt, the Ak-Sar-Ben Bridge Association announced. . . . Florida state officials attended ceremonies opening a new $500,000 bridge over the Suwannee River, near Live Oak. . . . The state highway commissions of *Missouri* and *Illinois* have agreed to proceed with preliminary surveys for a new bridge over the Mississippi River near *Quincy, Ill.*

Housing—The *York, Penna.*, City Planning Commission has approved plans for a 581-unit housing development, to be known as Clear Spring. . . . Plans have been completed at *Wilmington, Del.*, for construction of two garden-court apartment developments to provide 448 rental units. . . .Kowalski Construction Co. has completed plans for four garden-type apartments near *Syracuse, N. Y.*

Industrial Construction—The Continental Can Co. will build a $1,000,000 manufacturing plant at *Portland, Ore.* . . . The Western Saving Fund Society has awarded a contract to the Turner Construction Co. for construction of a 10-story office building in *Philadelphia,* to cost $3,500,000. . . . The *Toledo, Ohio,* Edison Co. has announced plans for a $29,000,000 construction program in northwestern Ohio. . . . The *York, Penna.*, Manufacturers' Association announced that industry in that area plans plant and equipment expansions totalling over $15,000,000 in the near future. . . . L. S. Ayers Co., *Indianapolis, Ind.*, department store, will build a $1,000,000, 11-story addition to its store. . . . Western Crown Cork and Seal Co. has started construction of a $2,000,000 factory in *San Francisco, Calif.* . . .The Carter Oil Co. started construction on a $16,000,000 refinery at *Billings, Mont.*

Miscellany—*Rehoboth Beach, Del.*, voters will decide July 19 on a proposed $361,000 bond issue for water and sewer system improvements.

Penn turnpike extension now being considered

Three to five routes for the planned eastern extension of the Pennsylvania Turnpike to Philadelphia are now being studied, according to T. J. Evans, Chairman of the Pennsylvania Turnpike Commission. Roger B. Stone, former chief engineer of the commission, has been reengaged to supervise the work.

It was said that the extension would connect Middlesex, near Carlisle, the present end of the 160-mile toll road, with Philadelphia. Additional studies will be made before any recommendation is sent to the governor.

The commission has retained the engineering firm of Gannett, Fleming, Corddry & Carpenter, of Harrisburg, to help on the study.

The commission also announced that revenue from the existing toll highway amounted to $4,100,000 for the fiscal year ending May 31.

***Road Straightening**—To eliminate the narrow, winding highway leading to Kanawha Airport, serving Charleston, the West Virginia highway department is now completing new sections of State Route 14. This section of the road, to be finished with a stone base and bituminous surfacing, was built by the A. S. Wikstrom Co., Bound Brook, N. J.*

Fishermen urge delay on Columbia River work

A proposed ten-year delay in construction of multiple-purpose dams on the Columbia River was opposed by farming and navigation interests, but supported by fishing interests at a recent public hearing held at Walla Walla, Wash., by the Columbia Basin Inter-Agency Committee.

During the 10-year "moratorium," it is proposed, the Fish and Wildlife Service could establish new runs of salmon in the lower Columbia, before the series of proposed dams either eliminated salmon or destroys their spawning grounds.

Inland Empire Waterways Association officers denied that the salmon runs were at stake. They said salmon runs in Puget Sound and halibut off shore likewise had been reduced where no dams were involved.

Thomas F. Sandoz, secretary of the Columbia Basin Fisheries Development Association, challenged the efficacy of the fishways at Bonneville Dam, although the count of blue-backed salmon —9,047—which passed through Bonneville Dam fishways that day, was the greatest for any day on record.

ENGINEERING NEWS-RECORD. Published every Thursday. **Return postage guaranteed.** Vol. 139, No. 3. Price 35c per copy. Allow at least ten days for change of address. All communications about subscriptions should be addressed to the Director of Circulation, 99-129 N. Broadway, Albany 1, N. Y., or 330 W. 42nd Street, New York 18, N. Y. Subscriptions, United States and U. S. Possessions, $6.00 for one year, $9.00 for two years, $12.00 for three years. Canada $7.00 for one year, $11.00 for two years, $14.00 for three years. Latin American countries $10.00 for one year, $16.00 for two years, $20.00 for three years. All other countries, $20.00 for one year, $30.00 for two years, $40.00 for three years. Please indicate position and company connection on all subscription orders. Entered as second-class matter October 29, 1936, at the Post Office at Albany, N. Y., under the Act of March 3, 1879. Printed in the U.S.A. Cable Address: "McGraw-Hill New York." Member A.B.P. Member A.B.C. Copyright 1947 by McGraw-Hill Publishing Company, Inc. All rights reserved. James H. McGraw, Founder and Honorary Chairman; JAMES H. McGRAW, JR., President; CURTIS W. McGRAW, Senior Vice-President and Treasurer; JOSEPH A. GERARDI, Secretary; NELSON BOND, Director of Advertising; EUGENE DUFFIELD, Editorial Assistant to the President; and J. E. BLACKBURN, JR., Director of Circulation. **Publication office: 99-129 North Broadway, Albany 1, N. Y. Editorial and Executive Office: 330 West 42nd St., New York 18.** District Managers and Branch Offices: Fred G. Hudson and L. H. Hunt, 520 N. Michigan Ave., Chicago 11; 738-39 Oliver Building, Pittsburgh; J. W. Otterson, 68 Post St., San Francisco 4; Aldwych House, London, W. C. 2, England; Washington; J. M. Spackman, New York; A. B. Cozzens, Philadelphia; E. E. Duff, Jr., Cleveland; B. F. Horn, Detroit; W. E. Donnell, St. Louis; R. N. Phelan, Los Angeles; W. G. Payne, Boston; Ralph Maultsby, Atlanta, Ga.

Seeks Inter-American road completion

(*Continued from first page*)

fault with the original proposal to complete the road as part of the war effort, but also criticized the efficiency with which the work was carried out.

Committee is highly critical

Conclusions of the committee's report are as follows:

"1. The War Department should not have undertaken construction of the Inter-American Highway as a war project. It added $36,000,000 to the cost of World War II without contributing to the defense of the U. S. The American war effort was hampered by the diversion of vast quantities of construction equipment, road materials, manpower, and shipping in 1942 and 1943.

"2. The project was conceived hastily and founded upon an absence of sound planning or reasoning. War Department approval was predicated almost wholly upon information supplied by the PRA. These estimates clearly specified the conditions under which a highway could be completed within the time desired. The War Department disregarded the conditions and ordered the highway built, notwithstanding clear evidence that it was impossible to execute the project as ordered.

"3. Both before and after approval of the project, the official position of the War Department had consistently been that an overland route to the Panama Canal was not required for the logistical support of our forces in Panama. Nevertheless, the Secretary of War on July 23, 1942 advised the Secretary of State that the construction of the Inter-American Highway was an urgent military necessity. The War Department invaded the province of the State Department in certifying that the promotion of continental solidarity was an urgent military necessity.

"4. Execution of the project by the Army Engineers was unbusinesslike. Excessive equipment rentals were paid; records were inadequate; supervision of contractors was ineffectual; coordination with the PRA was poor; termination was ordered belately.

"As a result of these and other inefficiencies in handling the project, only 347 miles of road were completed at an expenditure of $36,000,000.

"Only one-third of the work done by the Army engineers is estimated to be useful to the future Inter-American Highway. Much of the work done by the Army Engineers was on road which will not be used by the PRA.

"5. Some contractors' profits were excessive. General provisions to prevent inordinate profits—such as price ceilings, income taxes, and renegotiation—as applied to this project have not proved effective to date.

"6. Representatives in the U. S. State Department and the PRA were ineffective in securing agreements for selecting a route for some sections of the highway. In general, the route is located through the mountains, necessitating tremendous cuts and fills, adding to the difficulty and cost of construction, and will result in a tortuous highway transversing mountains as high as 10,000 ft.

"7. The route of the highway in some sections is unnecessarily circuitous—in Nicaragua, the official highway is routed to pass by property owned by the former President, this detour adding 42 miles to the length of the highway. In El Salvador, the official route makes a detour adding 14 miles for the purpose of serving a port. In Guatemala, a wholly new route, deviating from two existing alternative routes, was selected to connect Guatemala City with the Mexican border. In all three of these instances of unnatural location of sections of the route, there was violent disagreement between the PRA and the Army engineers. This resulted in an anomalous situation where two U. S. agencies were doing work on routes paralleling each other.

"8. The U. S., since 1942, has spent $3,000,000 for partial construction of a 160-mile road in Nicaragua from San Benito to Rama, a river port. This project, which will cost $6,500,000, was not approved by the Congress and the funds used were taken from the so-called secret or emergency fund of the President. Another $1,200,000 was spent by the Coordinator of Inter-American Affairs between 1942 and 1944 to construct the 40-mile Lake Yojoa Road in Honduras. This was admittedly a make-work project to relieve unemployment in Honduras and did not have Congressional approval.

"9. The State Department has been remiss in failing to negotiate firm agreements providing for the maintenance of the highway after its completion and in guarding against prohibitive restrictions or regulations which would prevent its full use. Failure to maintain any section of the highway or the imposition of onerous restrictions in any section will render the highway useless.

"10. Although a total grant of over $74,000,000 and loans of $48,000,000 of U. S. funds have been committed to this project, the highway is not half completed. In September, 1946, the PRA estimated that it would cost an additional $65,000,000 to complete the highway. Accordingly, a project which was estimated in 1941 to cost the U. S. a total of $20,000,000 will now cost at least $139,000,000."

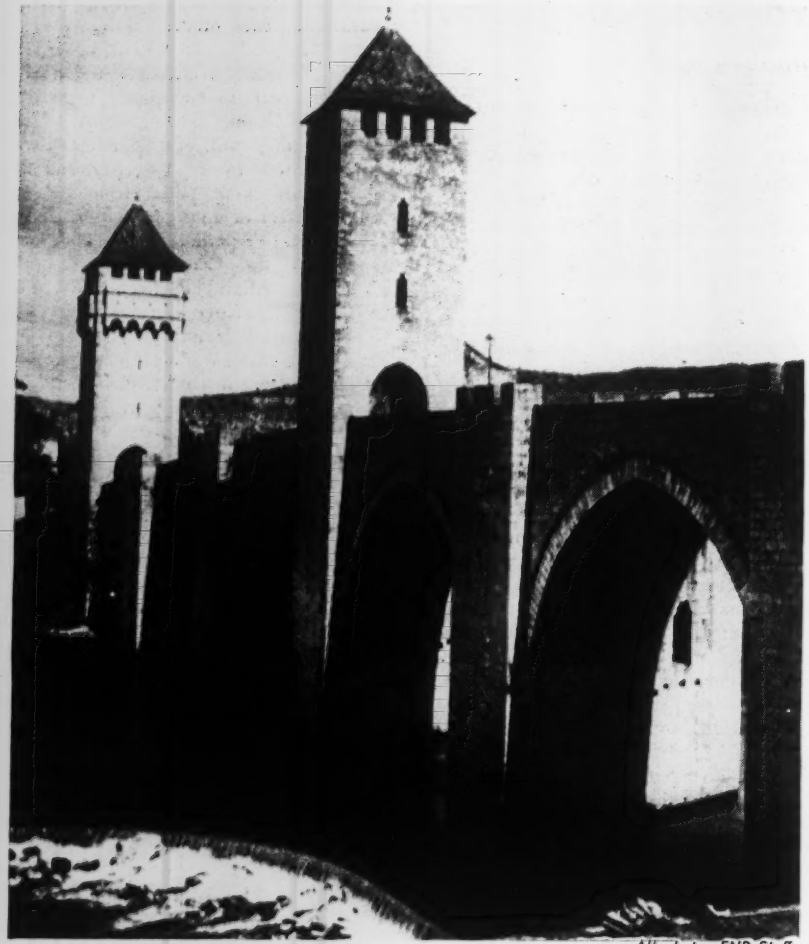
***Watercourse Enlarged**—The Los Angeles, Calif., Department of Water and Power is now installing new streamlined concrete piers to support sections of the city's aqueduct crossing canyon-floor watercourses, to prevent recurrence of washouts. At Grapevine Siphon, where the first piers were installed, the channel was widened and deepened, and three piers were built lengthening the pipe-span from 27 to 66 ft. Longer spans were made possible through use of steel ring girders, welded to the siphon and embedded in the reinforced concrete of each pier.*

Views questioned

One conclusion that has received unfavorable comment in Washington engineering groups is the statement that a mountainous location was chosen when a coastal route would be better. The committee is believed to have overlooked several important factors that entered into the original planning.

These factors included the general requirement that the road pass through the areas of greater population of each country, which usually meant the higher land and the mountainous sections of the republics. Also, the Central American republics desired that, if at all possible, the highway pass through their capitals.

Interested groups also point out that in the original planning for the road existing highways had to be used as much as possible. Since most of the roads already improved to any degree were in the more populous or the mountainous regions, this restriction favored the present location. It is further claimed that a coastal road would have been much more difficult to build than the committee indicates, because of the numerous streams to be crossed.



All photos ENR Staff

***Most beautiful** of fortified bridges remaining from medieval times is the Pont Valentré at Cahors over the Lot River.*

EUROPEAN NOTEBOOK . . . .

History and Hydro Power in Southern France

By WALDO G. BOWMAN

Marseilles, France—Four days ago I was in Paris on the Seine. Today I am in Marseilles on the Mediterranean. In between is a 700 mile auto trip on a great arc scribed through Orleans, Tours, Toulouse and the early Roman provinces that include such historic engineering structures as the Pont Valentré, the coliseum at Nimes, and the Pont du Gard.

In this area, reconstruction and building for the future is constantly encountered, not in boom proportions, but substantial nevertheless. Progress is slow, but this is not unusual here even in prosperous times.

One gains the impression that there is nothing the matter with France that a million kilowatts of new hydro power and a million tourists would not cure.

Hydro power and tourists are in fact engaging French attention. The coal shortage, so frightening now all over Europe, was a pressing problem in France long before the war.

Blessed with many dam sites on amply watered streams, the French began looking to their utilization immediately after the first World War. By 1934, Kembs Dam on the upper Rhine had been built, as well as two dams on tributaries of the Garonne in the Massif Central area northeast of Toulouse. One of these is near Entraygues on the Truyère, a tributary of the Lot which flows into the Garonne. The other is at Mareges on the Dordogne, and a part of a four-dam development projected for the gorge of this important stream.

The depression of the Thirties caused a cessation of work, but by 1938 French courage returned, and a new program was approved to produce 4.2 billion kilowatt-hours per year.

Although there were 61 projects, more than one-third of the total energy was to be generated on the Rhone River, principally at Genessiat Dam to be built near the Swiss border, while most of the remainder was to result from new dams on the Garonne tributaries.

It is interesting to note that an additional 5 billion kw.-hr. per year was projected in 1941, and in 1945 about 1.7 billions more, the latter on the lower Rhone. By March, 1947, France had completed projects producing 2.5 billion kw.-hr. and had 9.5 billion more coming along.

Of the four-dam Dordogne project—Bort, Mareges, L'Aigle and Chastang, from north to south—Mareges has been in service for some time, and L'Aigle has just been placed in operation. Bort and Chastang have been begun.

One approaches L'Aigle after dropping down from the plateau of the Massif Central into a wild and isolated gorge.

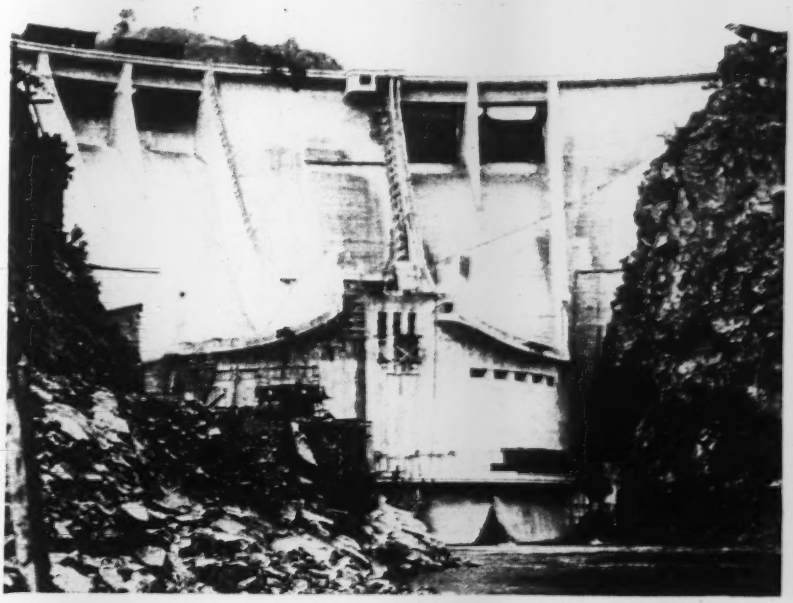
The dam presents a spectacular sight from below. A combined gravity and arch structure, it plugs a narrow, precipitous canyon. Moreover, its twin, centrally-located spillways, diverging and superelevated outward near the bottom, discharge high in the air over the 10-ft. thick roof of a powerhouse that presents a semicircular facade downstream.

The thick concrete roof resulted from the twin considerations of the weight of the maximum discharge of 70,000 cu. ft. per sec. over each spillway and the protection of the powerhouse from aerial bombs. Built with structural reinforcement from which the forms were suspended, the slab is further reinforced by 20 prestressed cables that hold it against the dam with a pull of 3,000 tons. Other prestressed cables reinforce the inner guide walls on the spillways, in both vertical and horizontal directions.

Some 296 ft. high and 963 ft. long, L'Aigle Dam will impound water to operate four 60,000 kva. turbines to produce 0.4 billion kw. hr. annually.

Spillways discharging over the top of the powerhouse are novel, but have a counterpart at nearby St. Etienne-Cantales Dam on the Cere River completed about a year ago (*ENR* Aug. 8, 1946, vol. p. 182). St. Etienne is not so spectacular in appearance as L'Aigle because of a more open location and a powerhouse with a straight instead of a curved facade. It is also of less capacity, about 75,000 kw. total, and is only 210 ft. high and 900 ft. long. These "ski-jump" spillways, which discharge their water far from the foundations of a dam, are an invention of A. Coyne, well known French engineer.

France could handle a lot more tourists this year than she is likely to get. At least that is the situation in this scenic southern region, however much it may be questioned in Paris where most of the tourists will undoubtedly pass their time. Hotels are being refurbished, and the ancient attractions are being made ready. Most important, the Services des Ponts et Chaussees, the federal highway department of France, is fast repairing the roads. Main highways are excellent, secondary and even tertiary roads are alive with construction operations.



***L'Aigle Dam**, second of four hydro-plants to be completed on the Dordogne, has a super-elevated spillway that discharges over the power house.*

A road roller is France's ace construction machine, and many of them are equipped with sets of rubber tired wheels that are retracted like an airplane landing gear when the roller is in use, but can be let down for transporting the machine from job to job.

In repairing the roads a 3-in. layer of about 1-in. size stone is first spread by hand on the old surface. Thoroughly rolled, it is lightly treated with tar or asphalt and then covered with chips, either by hand or by a modern truck spreader. This surface is rolled, tarred and rolled, again and again.

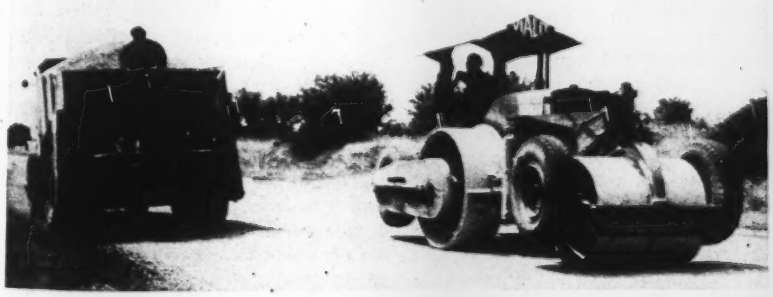
The majority of the main and secondary roads are 30 ft. wide. France has 48,000 miles of national roads, 15,000 miles of departmental or secondary roads and 220,000 miles of local roads. We tried a hundred or more miles of each type and everywhere found reasonably good riding surfaces and extensive activity.

Bridges are less satisfactory than the roads—not a new condition, either in France or the United States. The war damaged many bridges in some areas of France, (10,000 is the official figure for highway bridges alone) and the effect of this is still plain. Nevertheless the activity on the highways is being duplicated on the bridges. France has large supplies of stone, has already used it extensively and, in the present steel shortage, is perhaps extending its use.

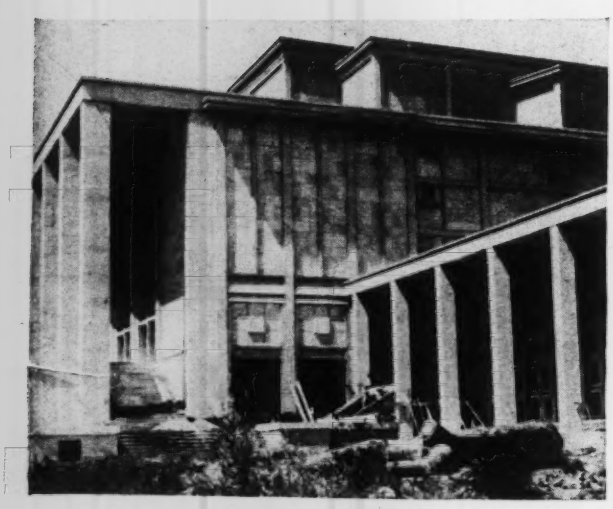
Timber trestles bypass wrecked spans while masons, aided by hand winches and not much else, rebuild the bridges to their original outlines. This was the case on the George V Bridge at Orleans although the other highway bridge a short distance downstream has been abandoned, and the debris cleaned from the Loire River. At Blois, further downstream, a parallel repair situation exists on two of the stone arches of the highway bridge. Built in 1724 by Jacques Gabriel, founder of the Ponts et Chaussees organization, this famous bridge will soon be restored to its original lines and remain an example of how simplicity can render a bridge beautiful.

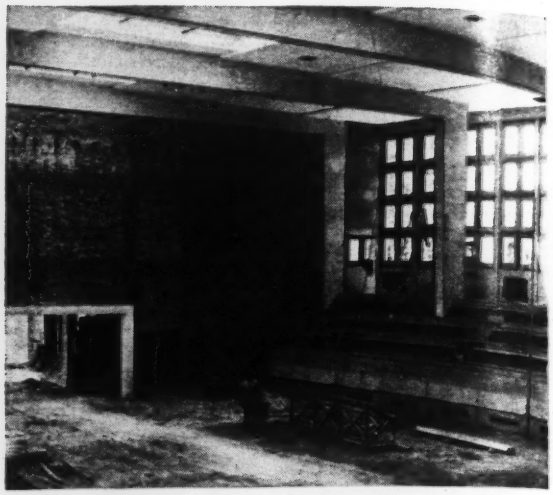
At Tours, along with Orleans the most badly war-damaged Loire valley city, exactly the same repair method is being used except that the falsework for the new stone arches is suspended from a steel truss instead of being supported by piling.

The slow pace at which major highway bridge reconstruction moves is in sharp contrast to the work on railway bridges. The S.N.C.F. (French National Railways) has put men, materials and machines in ample quantities on every job that has been undertaken. Many of these have involved spectacular tasks of lifting wrecked trusses, others have required masonry-arch rebuilding, and in a few cases entirely new bridges have been constructed. At Orleans is an example of the latter type job involving a new double track multiple arch bridge just upstream from the debris of the old. There is just enough room between the two structures for an industrial rail-



***A retractable** "landing gear" is a feature of many French roadrollers to permit them to be transported rapidly from one location to another. Modern chip spreaders are another piece of equipment that is aiding the repair of France's war-damaged roads.*





***Modernistic** "sports and arts" building under construction in Narbonne, ancient Roman city, is characterized by a facing, inside and out, of precast, bush-hammered concrete slabs. Wings at either side of the central hall, which accommodates a 3,000-seat theater on its upper floors, are framed with 80-ft. span steel rigid frames faced with the precast slabs. One wing (right) will contain a basketball court, the other a swinning pool.*

way, partly supported on old debris, partly on piles.

The new bridge at Orleans is of reinforced concrete and contains one arch of 155-ft. span and ten of 123-ft. It replaces fifteen stone arches of 80 ft., ten of which were completely destroyed and replaced by a pile trestle in November, 1944, over which trains have continued to run.

Just outside of Tours at Vouvray, the Montlouis Bridge, also across the Loire, has been completely rebuilt from the ruins of its twelve 82-ft. arches. In Tours, the Saint-Come Bridge is back in service. And so it goes. The S.N.C.F. is doing a splendid job, the results of which greatly benefit the French economy and reflect much credit on the technical skill of the engineers.

Many things besides war reconstruction will attract the tourist, and if he be an engineer or construction man, they will have a special interest, originating as they do with great builders of the past—Romans, Medieval monks and Renaissance architects and craftsmen. Familiar to many American engineers, these old structures went through the war undamaged, as they have weathered countless conflicts in the past. A few of them on the trip from Orleans to Marseilles are worth recalling.

The Loire Valley from Orleans to Tours is the chateau country, and the castles of the feudal lords as well as the palaces of the French Renaissance nobility dominate every strategic hill or rise above the trees of the vast estates.

One of the most amazing of the latter type is Chambord near Blois, built in 1526 by Francis I, who played a prominent role in building many of the early structures that are cherished by the French as national monuments. Some 385x560 ft. in plan Chambord contains 365 fireplaces—probably too few to heat it, at that. Either because he didn't like chimneys or from some caprice, Francis terminated each flue in a tower, turret, spire or lantern, with the result that the roof resembles a fantastic city, which even includes a church. To carry the illusion farther, the roof structures are separated by streets so that one can walk around in this village in the sky.

The roof of Chambord is reached by a unique double spiral staircase, 70 ft. high, one spiral for up-traffic, the other for down. It is a product of Jean Goujon, greatest sculptor of the time. A similar spiral staircase at nearby Blois Castle, set on the outside of the building and single rather than double, is attributed to Leonardo da Vinci, and it could well be that this artist-engineer-genius had a hand in developing the double corkscrew design at Chambord also.

The road down the Loire valley runs on top of a 30-ft. high levee lined either side with a 4-ft. stone wall. To the left is the Loire in a 2,000-ft. wide flood plain, to the right neat vineyards, wheat fields and now and then caves in the hills farther back where workmen live and the wine is stored. Grim looking fortress-like castles grow out of the highest eminences. Like so many areas in Europe, it differs little in topography from some that can be found in the U. S., but it resembles them not at all because of centuries of occupation by man and his works.

South from the Loire valley, across the high plateau country, the road drops down into the valley of the Lot River to Cahors where is located the Pont Valentré, most beautiful of the world's remaining fortified bridges. Towers at either end and one in the center rise 130 ft. above the river to give the six-span bridge a unique appearance. Built in creamy sandstone, the two-centered, 45-ft. arches have a recessed arch ring that emphasizes its structural significance. Cutwaters up and downstream add a massive note to an otherwise light and graceful structure.

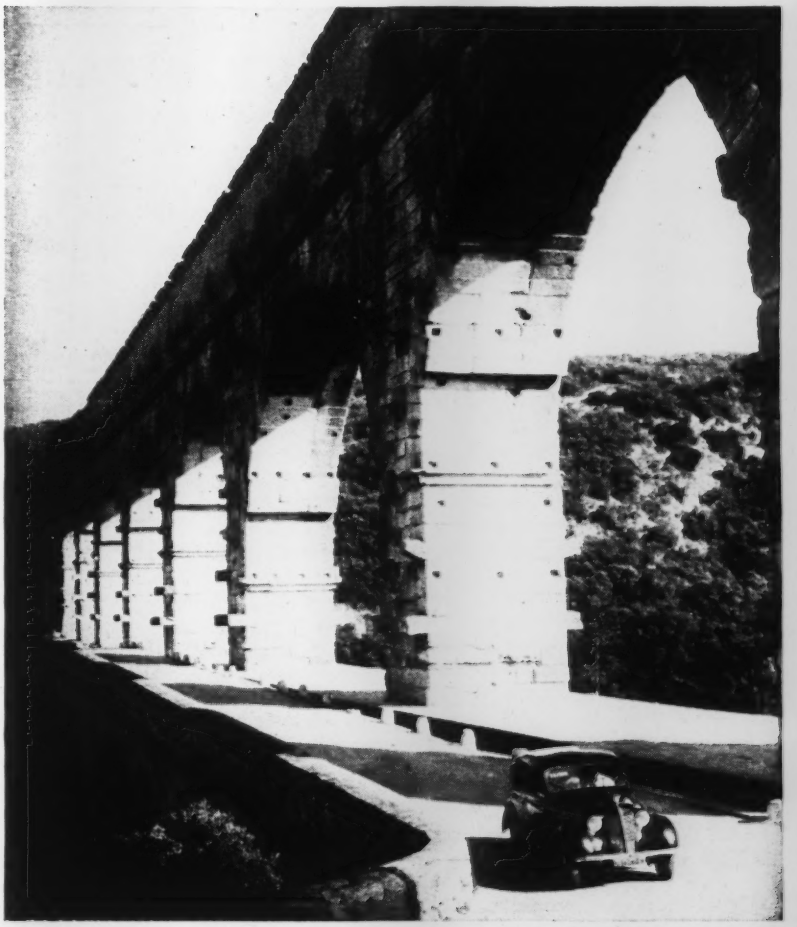
Near the top of the central tower is a stone with a sculptured devil clinging to it, perpetuating the legend of the bargain that the monk builder made to secure the aid of his usually mortal enemy in completing the bridge. On a promise that he could have the monk's soul in return for his cooperation, the devil kept his part of the bargain. But when the last tower stone was ready to be set the monk demanded that the devil bring him the water for the necessary mortar in a sieve. Failing in this, the devil was accused of breaking the contract, and the monk both kept his soul and completed the bridge. Present day engineers and contractors can readily recall when such monkish shrewdness might have gotten them out of similar unhappy contracts.

It was not easy to visit the Cahors bridge, for a bicycle race was being held along the town streets, and nearly the

whole area was blocked off. French sports are back to normal, a fact which also has some construction significance. Just outside of Poitiers a job that appeared to include extensive filter beds turned out to be a new football field under construction. In Nimes the famous Roman coliseum was being set up for a boxing match, and stadium seats had been built entirely around the arena. And in Narbonne there is under construction a spacious "arts and sports" building whose modernistic architecture contrasts sharply with the city's ancient aspect.

Some 430x180 ft. in plan, the Narbonne field house consists of a central portion flanked by two wings. The latter are spanned by 80-ft. rigid frames and contain respectively a swimming pool and a basketball court with tiers of spectator seats ranged on either side. The lower floor of the central area is reserved for fetes, while the upper contains a 3,000-seat theater. The entire building, except the rigid frames, is of reinforced concrete, and all wall surfaces, both inside and outside the building, are faced with bush-hammered precast concrete slabs. Cast about 3-in. thick, the slabs are reduced to a 2-in. thickness by the bush-hammering.

Narbonne is noted also as being a principal "port" on the famous Canal du Midi, as are Carcassonne and Beziers and its east and west terminals, Sete on the Mediterranean, and Toulouse on the Garonne, which gives access to Bordeaux and the Atlantic. This 125-mile barge canal, completed in 1680, is reputed to be the forerunner of all lock canals.



***Most famous** of Roman structures, the Pont du Gard is still, after 2,000 years, in a remarkable state of preservation. The roadway was added in 1774 so that the old aqueduct has a utilitarian as well as historical value.*

Two ancient monuments deserve the special attention of engineers, as they have for 2,000 years—the Pont du Gard, famous Roman aqueduct which brought water to Nimes from springs 24 miles away, and the medieval city of Carcassonne. Nothing the Romans built in Gaul equals the Pont du Gard in boldness or beauty. To carry the 4x5-ft. brick conduit across the 1,000 ft. wide valley of the Gard River they erected three tiers of the most perfectly proportioned stone arches imaginable. The lowest tier contains 6 arches of which the longest is 80 ft. while others vary from 51 to 63 ft. The second tier is of the same size and layout, while the top tier is made up of 36 arches of just under 16 ft. each. This top tier is 885 ft. long now and apparently was originally somewhat longer. A vehicle roadway, added in 1774 alongside the level of the first tier, has not marred the appearance of the structure. The conduit itself is lined with limestone deposits—a remnant of pre-water treatment days.

Carcassonne is the scene of constant repair and building operations to keep it as the best example of a complete medieval fortress town in existence. Restored originally in much the same fashion that Williamsburg, Va., was restored, the town offers moats, drawbridges, great towers, thick walls and cobblestone streets that attest to the efforts of the slave labor that created the original. There is probably enough stone in the 50 ft. high 20 ft. thick walls to duplicate the Empire State Building as a solid monolith.

One was reminded of slave labor in a more modern aspect on the road from the Pont du Gard to Marseilles along the east bank of the Rhone. Here, in a flat country resembling the Texas Panhandle, were thousands of mounds of rocks set about 50 ft. apart as far as the eye could see. Obstacles to Allied plane and glider landings, they had been built by the Germans with impressed French labor. On this same plain is Istres airfield, used by the Germans and enlarged by the U. S. Army Engineers to provide the Air Transport Command with a base in the Mediterranean area similar to Orly Field in the Paris region. Istres airfield served as the introduction to Marseilles itself where the almost destroyed port was rebuilt by these same U. S. engineers to such proportions that it handled 100 percent of its prewar traffic during the war. The installations then made are still serving efficiently. Despite much activity in rebuilding and harbor clearance the French have only put back 10 of the 127 ships berths to their final permanent condition. The Americans rebuilt 80 into a semipermanent state, and the French added 20 more. These 100 piers can if necessary serve for a good many years to come. The big postwar job that the French have done at Marseilles is to rebuild the drydocks, a herculean task considering the shortage of materials and labor, and the grave damage suffered as a result of German land mines.

HIGHLIGHTS OF MUNICIPAL DEVELOPMENTS

Summarizing current activities in city engineering and construction throughout the country

El Paso to begin work on $4.7 million grade separation projects—Akron adopts smoke control ordinance—Philadelphia checks subway extension bids—Little Rock considers establishing public works department—Honolulu plans sewerage program

A grade crossing elimination project, first proposed in 1901, to eliminate traffic snarls in the downtown district of El Paso, Tex., is expected to start shortly.

Estimated to cost $4,714,500, first work on the project includes the approval by the Federal Works Agency of an advance of $137,400 to finance the preparation of studies, specifications and drawings, and the employment of the Chicago engineering firm of De Leuw, Cather & Co.

El Paso's business district is now bisected by many tracks of the Texas & New Orleans Railroad, the El Paso & Southwestern Railway and the Southern Pacific and Texas & Pacific Railroad Companies, which in all total some 16 major grade crossings in the business district.

In 1901, the city council adopted an ordinance ordering the railroads to separate the grades in the business area, but little was done on the project. Today, with a population of more than 100,000, city engineers estimate that as many as 97 trains or engines block street crossings about 10 percent of each 24 hours.

Under the plan, as shown in the accompanying photographs, one entire set of tracks will be eliminated, while another parallel set will be increased from a two to a three-track line and depressed below the street level. The project will involve construction of eight vehicular overpasses over the depressed track section.

A supplemental project, to cost an estimated $280,000, is included for construction of storm sewers to protect the grade separation structures.

In other cities the problem of speeding business district traffic also concerned officials. At Baton Rouge, La., city officials considered a highway plan for the urban area centering about a high speed, four lane expressway on which traffic would move through the city without stops. The plan, designed to provide for growth of the capital city and eliminate one of the state's worst traffic areas on the road leading to the industries north of the city the superhighway is planned for construction in three sections and will cost an estimated $22,202,000.

At Milwaukee, Wis., a Common Council committee approved a proposed $8,442,000 street widening program that will result in giving the city a better highway leading out of the southern part of the area.

Waterworks program

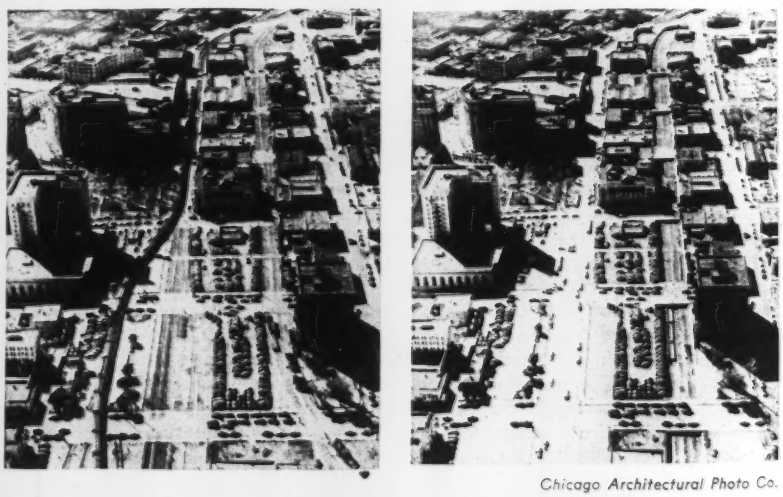
To provide Syracuse, N. Y., with 1,000,000 more gallons of water daily, the city has begun additional conduit construction between the Skaneateles gatehouse and Willow Glen. Deputy city engineer P. W. Kelly said a contract had been awarded to the Bethlehem Steel Co. for delivery of $125,505 worth of pipe to make up the 4,265 ft. conduit.

Meanwhile, the city of Port Washington, Wis., sent out queries to manufacturers to find out if they would be willing to bid on construction of a $280,000 municipal water filtration plant on which all bids were rejected a year ago. When bids were first called, the city received only one bid—for $400,000—which was rejected as being excessive. Mayor Charles L. Larson said that the City Clerk had been instructed to write eleven manufacturing firms to find out whether they would be interested in bidding on the project at this time.

Akron controls smoke

The Akron, Ohio, city council adopted a smoke-control ordinance, effective in mid-July, requiring that any new heating equipment installed after that date must comply with the provisions of the measure. Further, by mid-July of 1948, heating plants already in operation will come under the new regulation, although both home owners and industry are permitted five years in which to reach full compliance.

Similar to recent ordinances in Cincinnati, St. Louis, Pittsburgh, Salt Lake City, Utah and other municipalities (*ENR* July 10, vol. p. 24) the ordinance was developed after extensive engineering studies, with the cooperation of local industries. The law permits production of smoke equal to Grade 3 of the Ringleman chart and permits home owners and industry to burn a "good grade of soft coal" as well as hard coal in hand-fired furnaces. When the law becomes fully effective after five years, it will prohibit the sale of low



Chicago Architectural Photo Co.

***Railroads out**—Views of Main Street, El Paso, Tex., show the planned elimination of railroad track that now blocks downtown traffic an aggregate of 930 hours per day. As shown in the photo at right, on which an artist has superimposed new construction, one set of tracks will be eliminated, while the other will be depressed to provide overhead crossings.*

grade coal for use in hand-fired furnaces.

A nine-member smoke control board will administer the new ordinance, and will represent industry, heating and ventilating equipment operators and manufacturers, and the public.

Airport makes money

St. Louis, Mo. was one of the very few cities of more than 500,000 population to report a profit on the operation of their municipal airports during the past year, according to a survey by the International City Managers' Association. New York City was not included in the survey.

St. Louis city officials reported that revenues for Lambert-St. Louis municipal airport for the fiscal year ending April 7 totaled $137,495—and expenditures amounted to $69,170. The revenue figure represented a gain of $68,170.

Memphis improvement plan

Funds needed to start a $4,918,000 improvement program for Memphis, Tenn., will be provided in a bond ordinance passed on first reading by the City Commission recently.

The bonds will provide $1,120,000 for street improvement projects; $1,000,000 for sanitary sewer construction; $1,000,000 for parks; $1,000,000 for schools, and $500,000 for the city's share of the cost of the new Mississippi river bridge now under construction.

Honolulu sewerage

A complete modernization, extension and improvement of the Honolulu, T. H., sewer system scheduled to cost more than $15,000,000 will get under way early in 1948.

Available to finance start of the work will be $6,500,000 from two bond issues approved by the territorial legislature this year, and further money is expected to be appropriated by later legislatures.

Planned to take three years in construction, the program has two main phases: (1) the extension of lines into Honolulu's unsewered area (about 35 percent of the city) and improvement of existing lines; and (2) construction of a modern treatment plant on Sand Island in Honolulu Harbor.

Strict enforcement of health standards has kept the city's many cesspools from constituting a health menace to date, and the dumping of unprocessed sewage at sea so far has not contaminated world-famous Waikiki Beach. However, the tourist-conscious city and territory officials plan to eliminate any possibility of pollution by completion of the work outlined.

***Disposal plant for Honolulu**—Included in plans for a $15,000,000 modernization and improvement program for the sewage system of Honolulu, T. H., will be the construction of a treatment plant on Sand Island. Completion of the plant will extend sewerage to parts of the city not now served.*

Austin & Towill, Honolulu civil engineers, have prepared studies for the new sewer mains in the city, The Sand Island Plant, designed by Metcalf and Eddy with Guy N. Rothwell as associate architect, will be built on "made" land created by Army engineers for the purpose of housing such an installation.

Public Works Bureau

Little Rock, Ark., city councilmen last week had before them a proposal for the reorganization of the present city engineer's office into a public works department, to be headed by a non-engineer administrator and to consolidate all engineering and inspection activities.

The proposal, suggested in a recent study made by University of Denver graduate students, is expected to make for better engineering in the city by removing administrative work from the city engineer's responsibilities permitting the engineer to devote more time to purely technical problems.

HOW TO FIND A WATER MAIN

Quick conversion of a wartime mine detector has saved employees of the Lead, S. D., street department a lot of time.

The city commission decided that $14.95 spent for a mine detector was a cheap investment compared with the annual cost of labor and equipment to find water mains when they need repair. The mains apparently were not mapped when they were laid years ago, and when something went wrong it was a matter of pick and shovel work to locate the trouble.

Indianapolis water project

The Indianapolis Water Company began to implement its expansion program last week with the award of a contract for building the substructure of filter units of an addition to the Fall Creek purification plant, to the A. V. Stackhouse Co., Indianapolis, at a bid of $118,000.

Moreover the new unit will double the capacity of the plant and is the first step in a $700,000 program for expansion of facilities in the area served by the company.

At Phoenix, Ariz., already plagued with water shortages affecting the entire state, the city commission approved a recommendation of its engineer that a $1,158,000 bid of the Del E. Webb Construction Co. and the Arizona Sand & Rock Co. be accepted for construction of a municipal water treatment plant at the junction of the Salt and Verde rivers.

Sewage system proposal

The town council of Gibson City, Ill., was investigating the ramifications of a proposed $250,000 city sewer system and a sewage disposal plant as a means of complying with an order from the state sanitary water board which accused the city of contributing to pollution in Drummer Creek.

Other sewer and garbage disposal plans reported included: engineering plans for waterworks and sewerage systems in 16 cities in the state of Wisconsin were approved by the state board of health, including systems for Green Lake; Fall River; Hillsboro; Kimberly, Madison and Waukesha.

At Houston, Tex., city engineers said that work on a new $400,000 garbage incinerator near Buffalo Bayou would get under way within the next few weeks.

Sewer, water men open joint session

A joint convention of the American Water Works Association and the Federation of Sewage Works Associations will open July 21 at San Francisco, Calif.

Although the meeting is the first joint session of the two groups, it will actually be the twentieth annual meeting of the sewage works group and the 67th conference of the AWWA.

Among features of the five-day convention will be the meeting of a new slate of officers for the AWWA, including N. T. Veatch, of Kansas City, Kan., as president; Linn H. Enslow as vice president, and William W. Brush, who was re-elected as treasurer of the organization.

The twin convention will include two joint sessions. One of these will be a symposium on groundwater pollution problems to be held on July 22, and the other a meeting on utilization of sewage effluents, on July 23.

Entertainment features will, in most cases, be jointly conducted.

Papers to be delivered to the AWWA session include: a discussion of the Colorado River by S. B. Morris; a review of plant management, finance and accounting; a paper on testing materials and equipment for waterworks construction and operation by W. W. DeBerard and H. P. Hagedorn, and many other discussions of principal problems facing waterworks engineers and operators.

The FSWA meeting will include papers discussing developments in sewage disposal at San Francisco; the effect of sewage and waste disposal practices on industrial operating costs; industrial uses for reclaimed sewage effluent, and a symposium on biochemical oxygen demand which will include papers by Harold B. Gotaas, W. F. Langelier, David H. Caldwell, and R. G. Tyler.

Plan reconstruction at blasted Texas City plant

Contracts for the reconstruction of part of the Monsanto Chemical Co. plant at Texas City, Texas—destroyed in a blast and fire April 16—have been let to the W. S. Bellows Co. of Houston, Tex., and the Leonard Construction Co. of Chicago, Ill.

J. P. Mares, general manager of Monsanto's Texas Division, said initial contracts would total more than $6.000,000.

The Bellows Company will do all of the building work, Mares said, while the Leonard Company will install chemical process equipment and do piping and mechanical work. He estimated that the building contract would amount to a little over $1,000,000, while mechanical installations with process equipment would approximate $5,000,000.

The rebuilding of the remainder of the plant will be started when this work is substantially complete.

***Robert C. Kennedy,** assistant chief engineer and assistant general manager, and Blair I. Burnson, supervising sanitary engineer, both of East Bay Municipal Utility District, discuss plans for the forthcoming AWWA and FSWA conventions to be held in San Francisco. These men are co-chairmen of the local arrangements committee.*

High ferry rates promote bridges on Puget Sound

Rising ferry rates on Puget Sound at Seattle, Wash., has led to formation of the Northwest Washington Community Council, which advocates construction of bridges to eliminate ferries.

The Council, claiming support of 183,000 persons who live on the Olympic Peninsula and Puget Sound islands, proposes construction of bridges to the mainland from Washon Island, just south of Seattle. Its plan calls for a concrete pontoon bridge, some three miles long, from the Seattle side to the island and a mile-long suspension bridge west from the island, connecting with the Bremerton-Seattle highway.

The Council estimates cost of the bridges at $10,000,000, but responsible engineers question whether construction could be carried out. Engineers also question feasibility of the project, pointing out that the route is south of the main Seattle-Bremerton traffic flow and that the pontoon bridge would cross a navigable body of water. Army Engineers probably would object to any bridge that did not allow unobstructed passage for ships, it is believed.

An earlier plan calls for the establishment of a shuttle ferry service from Seattle directly west to Bainbridge Island and construction of bridges north and west from the island to the mainland. The longest of the two bridges would be 5,000 ft. and both would cost less than those to Washon Island. They would afford direct access from Seattle to the Olympic Peninsula.

***In a preconvention meeting,** the housing committee for the AWWA convention is here making a last minute check of hotel reservations. They are (left to right): John H. Peterson, Western region manager, transite pipe department, Johns-Manville; Geo. W. Pracy, superintendent, San Francisco Water Department; Keeno Fraschina, assistant superintendent, Richmond-Sunset sewage treatment plant, San Francisco; and N. A. Eckart, general manager and chief engineer, San Francisco Water Department.*

Award planning contract for army medical center

The Corps of Engineers, U. S. Army, has awarded the architect-engineer contract for a proposed $40,000,000 Army medical center at Forest Glen, Md., to Eggers and Higgins, of New York City, and Faulkner, Kingsbury and Stenhouse, of Washington, D. C. The two firms will handle the project as joint venturers. The Washington, D. C., District Engineer Office, through which the contract was awarded, will supervise the work.

Plans for this project call for the greatest medical research center in the world (*ENR* June 26, vol. p. 987). It will also serve as a teaching center and will be officially known as "Army Medical Research and Graduate Teaching Center." The center will include a 1,000-bed hospital, capable of expansion to 1500 beds, and many branches of the Army Medical Department now scattered throughout the United States.

Present buildings on the site will be utilized pending the initiation of a building program.

Power need forces lifting Hungry Horse Dam height

To meet rapidly growing power needs in the Pacific Northwest, the Bureau of Reclamation has changed its plans for Hungry Horse Dam in northwestern Montana in order to make the structure the third or fourth highest dam in the world, according to R. J. Newell, regional director.

After consultation with the Bonneville Power Administration, the bureau has decided to provide a reservoir on the South Fork of the Flathead River that will hold 3,500,000 acre-ft. of water, instead of the 2,000,000 acre-ft. originally planned.

A concrete dam at least 535 ft. high will be required under the new plans, Newell said. The final height cannot be determined until exploration of bedrock and final designs for the structure have been completed. The three highest dams in the world are Boulder, 726 ft.; Shasta, 602 ft.; and Grand Coulee, 550 ft.

The dam also would increase the water supply for irrigation of land near Kalispell, and provide flood control benefits as far downstream as Lake Pend Oreille, Idaho.

It is anticipated that the structure will be either a gravity or archgravity type. Until the Bureau's Denver Office, under Chief Engineer Walker R. Young, completes specifications, the exact cubic content of the structure will not be known. However, several million cubic yards of concrete will be required.

The dam will constitute a key unit in a comprehensive, long-range program to insure full utilization of the Columbia River and tributaries for maximum agricultural and industrial development of the Pacific Northwest. It will be located at a point 5.1 miles above the confluence of the South Fork and the Flathead Rivers.

Pre-construction operations have been under way for about two years. Access roads and most of the temporary section of a government town site have been built, and extensive geological explorations have been made.

Random Lines from an editor's notebook . . .

In which the new president of the American Water Works Association is given a quick "once-over."

Eminent consulting engineer, successful farmer and one-time semi-pro baseball player. Such is the versatility of Nathan Thomas Veatch, who this week takes office as president of the American Water Works Association at the annual convention in San Francisco.

N. T. VEATCH

Tom Veatch brings to this post of national importance the background acquired through 33 years of professional contact with waterworks design and construction as a member of the firm of Black and Veatch, consulting engineers of Kansas City, Missouri. His tenure of leadership comes at a time when nationwide waterworks construction and expansion is entering an era of unprecedented activity.

When he graduated from Kansas University, the classmates of Tom Veatch found reason to report in the yearbook that he was "a man without a bad habit." This was in 1909, and certain changes have taken place with the passage of time. For example, he is now an inveterate pipe smoker; so attached is he to this habit that the portrait photographer wouldn't accept any pose as characteristic unless Tom faced the camera with a pipe in his mouth—witness the result on this page and the front cover.

Some "bad" habits

Since we are on the subject of bad habits, we might just as well tell the whole story and report that on occasions, and under the proper kind of encouragement, Tom Veatch is known to have taken a drink. All of which should prove that what a man does before and after he graduates is his own business—unless he gets elected to the presidency of a national organization.

Thus it is that we dig into his record further, to discover, among other things, that in 1908 Tom had both professional and semi-professional interests. The first he satisfied while working as a chainman for the Santa Fe R. R.; the second interest found expression as a member of the Shattuck, Oklahoma, baseball team; had any big-league scouts been in the territory that summer, the AWWA would have not been exercising its claim 40 years later to the talents of Tom Veatch.

Not the least of these talents, incidentally, is his ability to work as hard, or harder, than his associates. And for relaxation he finds nothing more invigorating than a stiff workout on his 850-acre farm near Lawrence, Kansas.

A member of the AWWA since 1915, Tom has played an important role in its development. This was evidenced by his leadership in the formation of the Missouri Valley Section of the association, his service as a national director 1941-44 and more recently as vice president.

Affiliated as he has been with engineering design and construction on more than 500 water supply projects in the United States, Tom Veatch comes to the top post of the American Water Works Association with a sympathetic appreciation of the technical, political and economic problems affecting municipal water service. Couple this with his demonstrated qualities for aggressive leadership and you have a man whose tenure of office will prove to be a satisfying experience for both the association and himself.—*E.J.C.*

MEN AND JOBS

Aboard the sea-going Army hopper dredge "Goethals" are, left to right: Col. H. A. Kurstedt, executive officer, North Atlantic Division; C. E. Boesch, chief, engineering division, North Atlantic Division; H. G. A. Hayward, chief, plant branch, New York district; Maj. W. A. Correale, executive officer, New York district; and Col. W. F. Heavey, district engineer, New York District, Corps of Engineers.

C. A. Richardson is project manager for ***Merritt, Chapman and Scott*** *on a $13,000,000 Navy project of storing surplus ships at Green Cove Springs, Fla. Work includes building seven 1,845 ft. piers.*

Supervising highway relocation near Bloomington, Ind., are, left to right: C. H. Hunnell, assistant engineer of road construction; J. S. Taylor, project engineer, and W. L. King, assistant district engineer.

Frederick W. Crane, Buffalo, N.Y. city engineer, has been appointed general manager of the Buffalo Sewer Authority to replace Francis J. Downing, who has been manager since March, 1942. However, Mr. Downing has been retained as engineering consultant for 60 days, effective July 1, to assist the new manager in planning of a number of new projects. The new manager formerly served with the sewer authority in the capacity of assistant chief engineer.

E. G. Hewson, office engineer for the Canadian National Railways, Toronto, Ont., has retired after 38 years of service. A graduate in civil engineering from the University of Toronto, Mr. Hewson entered the service in 1909.

Alfred S. Gray, consulting engineer for the Wenas, Atanum and Highland soil conservation districts near Yakima, Wash., for four years, will join the engineering staff of the Rain-Bird Sprinkler Corp., Glendora, Calif. Frank Parsons has become acting engineer for the three districts.

Frederick W. Fisher, civil engineer, has retired from the Rochester (N.Y.) Gas & Electric Corp. after 37 years of continuous service. He was graduated from Cornell in 1903 and for several years was employed by New York contractors. He joined the Rochester Gas & Electric Co. in 1909 as a field engineer and later became safety and construction engineer. In 1919 he was engineer in charge of the plant's hydroelectric development. He was made director of the personnel and public relations department in 1927, a post he held until his recent retirement.

William R. Kauffman, Lewisburg, Pa., has been appointed resident engineer for the Williamsport district of the Pennsylvania State Highway Department.

Samuel E. Michael, Wilkinsburg, Pa., district construction engineer in the Pittsburgh District, and **Conrad F. Shindel,** Scranton, Pa., project engineer for the Scranton district, have resigned from the Pennsylvania State Highway Department.

Harold D. Hauf, architectural engineer and Yale University faculty member, is now consultant to the Connecticut State Comptroller to reorganize the real assets division of the comptroller's office. This division has handled all state construction work and building, with the exception of highway construction, since the abolishment of the Public Works Department in 1943.

William J. Cox, who resigned July 1 as Connecticut state highway commissioner, has joined the firm of Mayer & Whittelsey, New York. He will soon fly to India to make a traffic survey for the city of Bombay.

William L. Hyland, Frank L. Lincoln, and **Howard J. Williams** have been admitted recently to partnership in the firm of Fay, Spofford & Thorndike, Boston, Mass.

Lt. Col. Howard J. Lowe has been assigned to the Buffalo district Corps of Engineers office as executive officer. Colonel Lowe has been an officer of the regular army since 1937. He is a veteran of World War II with two years overseas duty, and has just completed a year's study at the University of Illinois for which he received a master of arts degree in civil engineering.

Charles F. Bradbury was recently appointed Jefferson County, Ky. road engineer to succeed W. B. RoBards. Previous to his appointment Mr. Bradbury was principal assistant engineer in the county road department. He has served with the Louisville & Nashville Railroad and the Kentucky state highway department.

W. F. Freeman of High Point, N.C., has been retained to make water and sewer surveys in an area recently incorporated into the city limits of Oxford, N.C.

California broadens registration law

Members of four branches of the engineering profession were brought under state registration in California by a bill passed by a recently adjourned session of the legislature.

The bill enlarges the State Board for the Registration of Civil Engineers from three to seven members and directs it to register also chemical engineers, electrical engineers, mechanical engineers and petroleum engineers. The new board will be called the State Board of Registration for Civil and Professional Engineers. The only major field of engineering left out is mining engineering.

Under the bill, the new board may issue a certificate to any engineer practicing in the fields covered who presents evidence of good character and experience in his field and who passes a written examination.

New applicants will be required to show evidence of six years' experience in their profession or of some equivalent of experience and education. Graduation from a recognized school of engineering counts four years towards the requirement, although each year of engineering training without graduation counts only one-half year of experience.

The amended registration law allows an applicant to take his examination in two stages if he so elects. On passing the first stage he is certified as an "engineer-in-training."

As amended, the law defines a "professional engineer" as "a person engaged in professional practice of rendering service or creative work requiring education, training and experience in engineering sciences, and the application of special knowledge of the mathematical, physical and engineering sciences in such professional or creative work as consultation, investigation, evaluation, planning or design of public or private utilities, structures, machines, processes, circuits, buildings, equipment or projects, and supervision of construction for the purpose of securing compliance with specifications and design for any such works."

The "professional engineer" classification is distinct from and in addition to the more specific definitions in the old law covering "civil engineer" and "structural engineer."

The new board will continue to include three civil engineers and will add one member from each of the other four fields.

Building restrictions lifted in Canada

Finance Minister Abbott told the Canadian House of Commons at Ottawa recently that the government had removed its control on rental and eviction on housing completed after January 1, 1947. The removal of rental and eviction control applies to all new houses, apartments and duplexes and should encourage construction of housing for rent.

Other moves contemplated, Mr. Abbott said, include: Complete de-control of commercial building next spring; immediate removal of restrictions on use of vacant lots for auto parking and servicing, and immediate removal of controls from all places of entertainment and public halls.

EJC names advisory group to aid State Department

The Engineers Joint Council said last week it had formed a five-man advisory committee to serve as a consultative and advisory group to the State Department and to serve the ECJ representative on the U. S. National Commission on the United Nations. Authorization of such a commission has been advocated by EJC for a long time.

To be called a "Consultative Committee to the Committee on International Relations of EJC," the group is composed of one member of each of the constituent societies. The committee was formed at the request of the State Department.

Members include: E. M. Hastings, president of the American Society of Civil Engineers; Clyde Williams, president of the American Institute of Mining and Metallurgical Engineers; D. Robert Yarnall, past president of the American Society of Mechanical Engineers; W. E. Wickenden, past president of the American Institute of Electrical Engineers; and J. G. Vail, past president of the American Institute of Chemical Engineers.

Study strength factors of riveted, bolted joints

Study of the strength of riveted and bolted joints is one of the latest projects to be sponsored by the Engineering Foundation. The research is being carried on at the University of Illinois and Northwestern University under the direction of a research council whose members represent the various interests concerned.

Investigation will be made into the static and fatigue strength of joints in tension members with various rivet patterns; the static and fatigue strength of structural joints fabricated with hot-driven rivets, cold-driven rivets, carbon-steel bolts and alloy-steel bolts; and the relation between the properties of metals and the behavior of structural members. Similar practical problems will be added as work progresses.

Reclamation bureau streamlines office staff

Streamlining the administrative structure of the Bureau of Reclamation to consolidate budgeting, programming and financing activities in one office was announced last week.

The action establishes, effective immediately, a new Office of Program and Finance by consolidating the former Office of Finance, the Office of Progress Control, and certain budget functions of the Office of the Engineer Assistant. A second new office, that of Comptroller, also was created.

Alfred R. Golze, formerly assistant director of the Branch of Operation and Maintenance, has been named director of the new Office of Program and Finance. A graduate civil engineer of the University of Pennsylvania, Mr. Golze recently has directed formulation of programs and the appropriation and allotment justifications to make them effective, and also has acted as special assistant to the commissioner.

REPRINTS AVAILABLE

Reprints of the *Engineering News-Record* report "What Can Be Done About High Construction Costs", printed originally in the May 29 issue, are again available.

Price is 25 cents for single copies, or three for 50 cents. Address requests to "Editorial Department, Engineering News Record, 330 West 42nd Street, New York 18, N. Y.

MODEL TOWN TO BE SOLD

The model town of Norris, Tenn., named for the late U. S. Senator George W. Norris, will be sold at public auction in a year or so, the Tennessee Valley Authority said last week.

The town was built by TVA in 1933-35 to house workers on the Norris Dam.

Norris has 336 family dwellings, a dormitory, an administration building, school, postoffice, fire department and other facilities.

Army engineers design new arctic-type shelter

A prefabricated temporary arctic shelter for troops, capable of providing an interior temperature of 70 deg. F. while the outside thermometer registers 70 deg. below zero, and able to withstand the impact of a 125-mile-an-hour wind, is being designed by the Corps of Engineers.

Present plans call for a building light enough in weight to be transported by airplane or glider, and so simple in construction that it can be quickly erected by unskilled men wearing Arctic clothing—including gloves.

To meet weight requirements, engineers are using aluminum in preliminary plans, although design is such as to permit use of other materials if necessary. Plans are being made for construction of building units 8x20x9 ft., which can be expanded in two directions to any size without special connection devices. Interchangeable panels composed of two thin sheets of aluminum with insulation between, and 8x4 ft. in size, will be used for walls, flooring and roof.

Essentially, the design is based on a rigid-frame assembly. The floorbeam used is an open-web aluminum joist resting on a jack at each extremity. Supported on insulating footings, the jacks eliminate the necessity for precise workmanship in the field since they can adjust the level of the floorbeam for any terrain.

The building is to be flat-roofed. Plans call for fixed windows and efforts are being made to develop plastic panes. Doors will be of the same material as the walls.

The U. S. Army's experiments parallel similar experiments being conducted by Timber Structures, Inc., of Portland Ore., for the Canadian government which plans to use prefabricated structures for Arctic weather stations (*ENR* June 19, vol. p. 973).

Award $5 million Central Valley contract

The Bureau of Reclamation last week announced the award of a $5,888,000 contract for construction of a canal and pumping plant for the Central Valley project in California. The award, made under new authority delegated by the Secretary of the Interior, is the first to break through the previous $500,000 ceiling on contract authorizations by the Commissioner of Reclamation.

The contract—which calls for the construction of the 2½-mile Delta-Mendota Intake Canal, and the Tracy pumping plant and discharge lines—went to a group composed of Stolte, Inc., United Concrete Pipe Corp., Duncanson-Harrelson Co., and Ralph A. Bell, all of Oakland, Calif.

The Delta-Mendota Canal is one of a system of canals on the Central Valley project which together will have a total length of more than 400 miles to furnish water to some 2,100,000 acres of land. The canals will also supply water for municipal and industrial uses. Construction of two sections of the Delta-Mendota Canal—one 13 miles long and the other 11 miles—is already under way. The pumping plant at Tracy will lift water from the intake canal to a height of about 200 ft., and send it flowing for a distance of 120 miles through the canal along the west side of San Joaquin Valley. Six large electrically-operated pumps for the plant are being manufactured under a contract awarded last year.

Plan 181-mi. oil pipeline to Salt Lake City

R. G. Follis, president of the Standard Oil of California, has announced that his firm will construct a 10-in., $5,000,000 crude-oil pipe line from the Rangely, Colorado oil fields to Salt Lake City, a distance of 181 miles.

The company is now acquiring right-of-way. The line will parallel the Uintah mountains westward to the Wolf Creek Pass where it will cross a 9,480-ft. summit. Preliminary plans call for one initial pumping station and a booster station near Talmage, Utah.

Standard expects to build a refinery in Salt Lake City to refine the crude oil carried by the proposed line.

Great Lakes Army work under Chicago District

All military construction of the Great Lakes Division, Corps of Engineers, was placed under jurisdiction of the Chicago district office as of July 1, according to Col. W. B. Trower, district engineer.

Military construction now being carried on by the Milwaukee and Detroit districts in Wisconsin and Michigan has been transferred to the Chicago district.

Principal construction projects in progress and immediately affected by the transfer are at the Branch U. S. Disciplinary Barracks, Milwaukee, Wis.; the Percy Jones General Hospital, Fort Custer, Battle Creek, Mich.; and Selfridge Field near Mount Clemens, Mich. These projects consist mostly of housing for military personnel.

W. R. Nelson named aide to reclamation head

Wesley R. Nelson, formerly Bureau of Reclamation regional director at Amarillo, Tex., took office recently as Assistant Commissioner of Reclamation. Mr. Nelson succeeds William E. Warne, of California, who became Assistant Secretary of the Interior.

W. R. Nelson

A civil engineer, Mr. Nelson has been regional director at Amarillo since 1943. A graduate of the University of Colorado and the University of Southern California, he worked for several years as draftsman and surveyor and as a field engineer in mining and civil engineering operations in the West. He joined the Bureau of Reclamation in 1931 as an engineer.

In April, 1936, Mr. Nelson was assigned to the Washington office to supervise the reclamation engineering organization.

Frisco starts $5 million Missouri terminal work

The Frisco railroad has started work on a $5,000,000 industrial expansion program at Springfield, Mo., that will include a vast northside freight yard, 40 miles of switching track and several new buildings.

Plans include a 2,960-car track system; one of the biggest icing docks in the West; a two-story office building at the shops; a 100,000-gal. water tank; a new west shop roundhouse for 50 locomotives; a two-story restaurant building; a 400-ton coal chute and a new sewage system.

Removal of an estimated 1¼ million yards of dirt to make way for the construction and grading of the site is scheduled as a first step in the program.

Mississippi bridge work delayed by pile shortage

Construction of piers for the Arkansas approach to the new Mississippi River bridge at Memphis, Tenn. has been delayed by a shortage of steel piling for the pier foundations.

William Denny, superintendent for Merritt, Chapman & Scott Corp., which is doing the work, said that the piling is being delivered and work will probably begin about Aug. 1.

Illinois widens eminent domain rights

The Illinois House of Representatives last week passed a bill designed to facilitate construction of superhighways and other state roads by modernizing the state's right of eminent domain.

Under the new law, the state may deposit with local courts the amount it is willing to pay for a piece of property needed for highway work, and take immediate possession of the land, pending court adjudication of the payment. The only exception to this right would be in a case where "hardship" can be proved.

With passage of this bill in the lower House, state highway engineers made plans to begin at once the construction of a superhighway from 27th St. in Chicago along Western Ave. as far southwest as the Cook County line. The action on the Chicago superhighway was also spurred by the signing on July 1 of federal law which conveys to the State Department of Public Works and Buildings the old Illinois and Michigan canal. This canal, completed in 1848, extends an overall distance of 96 mi. southwest from Chicago.

The new state law, similar to one urged for some time by the American Road Builders Association and other interested groups, would eliminate the present requirement that the state wait on court action before taking possession of land it needs for highway work. Only the state would be permitted to take advantage of the law, however.

Under the bill, the state may file a court document declaring its need for the property for highway purposes and deposit with the court the amount of money it is willing to pay for the property. The owner may then take the money and close the negotiations, or leave it with the court pending a jury trial. Meanwhile, the state may take possession of the property immediately upon filing declaration in court and depositing the money, excepting in cases of hardship where the court could allow the property owner to remain in possession for a period up to six months.

The measure was backed by Governor Green of Illinois, and it is indicated that if passed by the upper House it will be taken immediately to the State Supreme Court for a test as to its constitutionality.

Flood control report requested by President

President Truman has requested the Corps of Engineers to make a comprehensive report on desired flood control construction for the entire Mississippi River Basin.

The President made known his request at a conference with Lt. Gen. R. A. Wheeler, Chief of Engineers; Brig. Gen. Lewis A. Pick, in charge of the corps' Missouri River Division, and Gordon R. Clapp, head of the Tennessee Valley Authority.

The report is being prepared on a rush schedule and the President is expected to report to Congress some time this week on the comprehensive plan, which is expected to cost several millions. In making this fact known, Mr. Truman said that he was still in favor of a Missouri Valley Authority as the best way to control floods in the basin and at the same time permit maximum development of that area.

Housing contracts let at Muroc Army Air Field

Contracts for over a million dollars worth of housing and other construction work at the Muroc Army Air Field had been awarded last week, the Los Angeles, Calif., office of the Corps of Engineers said.

William Radkovich Co. was given the job of erection of 100 temporary family quarters at a cost of $750,000. Installation of sewer and water facilities for the buildings will be made by Alex Robertson of Los Angeles on a bid of about $290,000.

Schurr & Finley were awarded the contract for installation of electrical distribution system at a cost of $350,000.

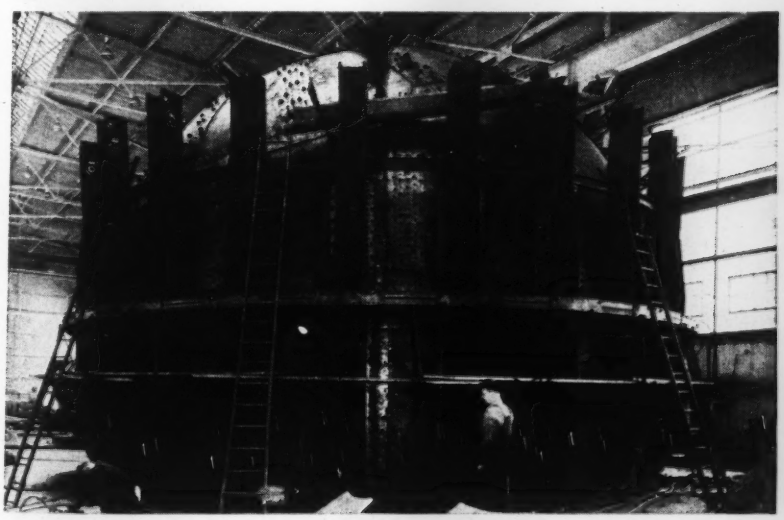
Approve agency to build new Delaware tunnel

Establishment of a new Delaware River Tunnel Board, to cooperate with a similar New Jersey agency for the construction of a tunnel under the Delaware River in or near Philadelphia was authorized by Gov. J. H. Duff of Pennsylvania last week.

He signed into law a measure permitting the new board to issue bonds for construction of an underwater vehicular tunnel anywhere in Philadelphia or in Delaware county, and to charge tolls to pay off the bond issue.

In another move to improve vehicular communications between the two states, Governor Duff also last week signed an agreement with New Jersey to authorize construction of "one or more" new toll bridges over the Delaware River north of Philadelphia. A similar law and agreement have already been signed by Gov. Alfred E. Driscoll of New Jersey.

The bill extends the power of the existing Delaware River Joint Toll Bridge Commission so that it may finance new bridges through bonds. Approval of the U. S. Congress is required before the measures can go into effect.



***Surge Tank for Ft. Peck**—Up-ended for shop assembly, bottom section of one of three surge tanks for power penstocks at Fort Peck Dam is bolted up at fabricating shop of the Chicago Bridge and Iron Co. to assure fit before shipping. Among the largest such tanks ever built, these units have inside diameter of 40 ft., and height of 148 ft. from spring line to top. Each tank requires 650 tons of steel.*

OBITUARY

William F. Drysdale, 66, a civil engineer who was vice-president of the Montreal (Quebec) Locomotive Works, and had served as director-general of munitions production for the Canadian government, died at Montreal July 4.

Frank J. Trompeter, 59, president of the Trompeter Construction Co. of LaSalle, Ill., and long identified with Illinois highway construction activity, died at LaSalle July 3.

William S. Lee, 70, a consulting engineer of Montreal, Quebec, died there July 5.

Thomas R. Brunson, 66, a civil engineer for the Interstate Commerce Commission, died July 6 at Washington, D. C. A graduate of the University of Arkansas in 1908, Mr. Brunson was employed as an engineer with the ICC from 1914 to the entry of the U. S. in World War I, and rejoined the commission in 1930.

M. M. White, 41, city engineer of Elizabeth City, N. C. for the past 20 years, died there July 4.

William Rand, 85, an engineer and land surveyor at Canning, N. S., for the last 60 years, died there recently.

Leo J. Voell, Sr., 68, a civil engineer and former vice-president of the Milwaukee, Wis., construction firm of W. W. Oeflein, Inc., died at Milwaukee July 7. In 1934, Mr. Voell served at Washington, D. C., as director of the Public Works Administration's housing construction division.

Paul W. Armstrong, 59, vice-president of the Mississippi Valley Structural Steel Co., of Chicago, died at Chicago July 1.

R. L. Young, 65, district construction engineer for the California State Highway Department at San Bernardino, Calif., died there recently. A Native of Fredonia, N. Y., Mr. Young graduated from Syracuse University, and joined the California department as an engineer in 1921.

Edward C. Panton, 58, heavy construction manager for the Bechtel Corp., died recently at his home in Del Monte, Calif. At the time of his death, Mr. Panton was in charge of construction on the Friant aqueduct of the Central Valley project. Born in Spokane, Wash., Mr. Panton graduated as a civil engineer from Cornell University in 1914, and followed his engineering career largely in the west, with long service in irrigation, hydro-electric, and bridge construction work. He joined the Bechtel organization in 1933.

J. C. Harding, 43, assistant highway engineer for the Arkansas State Highway Department, died at Little Rock July 4.

Abraham Bricken, 63, formerly president of the Bricken Construction Company of New York City, died in New York City July 7. Well known as a builder of skyscrapers, Mr. Bricken's company was responsible for construction of some 25 such buildings.

Frank W. Arneson, 56, who served as Winneshiek County, Iowa, for 30 years until his recent retirement, died recently at Decorah, Iowa.

Idaho Power seeks hydro project permit

The Idaho Power Co. has filed an application with the Federal Power Commission requesting a 24-month preliminary permit for a hydroelectric project on the Snake River where the waterway is the boundary between Oregon and Idaho. The site proposed for the project is known as "Oxbow" and is located about 134 miles up the river from Lewiston, Idaho.

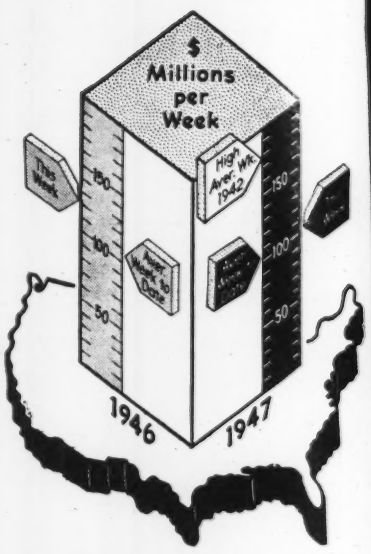
The proposed development includes a concrete dam across the river forming an 11-mile lake with a surface area of about 1,000 acres, and creating an effective head of about 120 ft. Other parts of the project include enlargement of the present Oxbow tunnel to carry about 8,000 cfs., construction of a similar concrete lined tunnel of 8,000 cfs. capacity through the Oxbow to the power plant site, and a power plant to be located on the Oregon bank of the river about 3 miles downstream from the dam at the north outlet of the tunnels. The power plant would have an installed capacity of about 188,000 hp.

MAJOR MEETINGS

American Water Works Association, 67th annual conference, jointly with Federation of Sewage Works Association, 20th annual meeting, Civic Auditorium, San Francisco, Calif., July 21-25.

Federation of Sewage Works Associations, jointly with American Water Works Association. See above.

American Congress on Surveying and Mapping, 7th annual meeting, Statler Hotel, Washington, D. C., August 14-15.



As Reported this week to . . .
Engineering News-Record

CONSTRUCTION ACTIVITY

CONTRACT VOLUME

Continental U. S. Only (Thousands of Dollars)

	Week of July 17 1947	Cumulative 1947 (29 wks)	Cumulative 1946 (29 wks)
Federal	$14,071	$389,779	$442,583
State & Mun.	39,084	918,653	736,572
Total Public.	$53,155	$1,308,432	$1,179,155
Total Private	51,195	1,654,072	1,848,768
U. S. Total	**$104,350**	**$2,962,504**	**$3,027,923**

WHERE CONSTRUCTION ACTIVITY ORIGINATED THIS WEEK

Dollar Volume (Thousands)

Type of Work	This Week	Cumulative 1947 (29 wks)	Cumulative 1946 (29 wks)
Waterworks ..	$3,340	$62,699	$52,959
Sewerage	2,910	72,614	54,629
Bridges	1,553	88,634	73,476
Highways	13,923	437,422	429,987
Earthwork, Waterways	12,575	186,131	242,014
Buildings, Public	11,267	303,358	218,171
Industrial ..	15,191	424,955	570,752
Commercial .	29,869	971,177	1,164,689
Unclassified ..	13,722	415,514	221,246

NOTE: Minimum size projects included are: Waterworks and waterways projects, $22,500; other public works, $40,000; industrial buildings, $55,000; other buildings $205,000.

NEW PRODUCTIVE CAPITAL

	Cumulative 1947 (29 wks)	Cumulative 1946 (29 wks)
NON-FEDERAL ...	$1,084,058	$894,309
Corporate Securities	438,119	246,068
State and Municipal	645,939	423,241
Fed. Aid Highway.	.....	225,000
FEDERAL	.....	925,275
Total Capital	**$1,084,058**	**$1,819,584**

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost..	July '47	406.52	195.41
Building Cost.....	July '47	304.87	164.80
Volume	June '47	276	121